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Compensation Programs for Wildlife Damage in North America

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Abstract Financial compensation for damages caused by wildlife is an alternative to lethal wildlife damage management techniques, but little is known about the use of these programs in North America. We conducted surveys requesting information on wildlife species and type of damage covered by compensation programs, annual cost of programs, and the monitoring and assessment of program success to the wildlife agencies of all states and Canadian provinces. We also requested information on programs providing producers with damage-abatement materials instead of or in addition to financial compensation. All states and provinces responded to our survey. Nineteen states and 7 provinces had compensation programs, and 34 states and 7 provinces provided damage-abatement materials. Most programs were funded by the state, but private and federal organizations also funded some programs. Deer (*Odocoileus* spp.) were the most common species in compensation programs (in 14 states and provinces) followed by bear (*Ursus* spp.; in 12), elk (*Cervus elaphus*; in 10), moose (*Alces alces*; in 7), waterfowl (in 6), pronghorn antelope (*Antilocapra americana*; in 6), wolves (*Canis* spp.; in 5), mountain lions (*Puma concolor*; in 4), and coyotes (*Canis latrans*; in 3). Compensation programs involving ungulates included damage to cultivated crops (in all 15 states and provinces), standing hay crops and pastures (in 5), stored hay (in 6), and damage to other property including fencing and irrigation equipment (in 8). Programs for predators involved livestock losses. Programs for bears involved damage to crops, livestock, and beekeeping equipment. In general, compensation programs were established for problems that were recent in origin, exacerbated by governmental actions, or caused by highly valued species. Few states or provinces had formal evaluation procedures for their programs. Given the expense of compensation programs and divided opinions about the programs, we recommend that all states and provinces implement a formal review system.

Key words compensation, economics, wildlife damage management

Wildlife damage management techniques can be divided into 3 general categories: managing the offending animal or its habitat, modifying human activities, and increasing human tolerance of wildlife. Compensation programs fall in this last category and involve paying agricultural producers for all or a portion of the value of crops, property, or livestock damaged by wildlife.

Compensation programs eliminate the risk of direct injury to humans and wildlife from damage management tools like traps and pesticides, and may increase landowner tolerance of problems with threatened or endangered species (Olsen 1991). Compensation also may be a useful tool in situations where private lands include, or are adjacent to, habitat critical for the well-being of a wildlife species or population

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(Van Eerden 1990, Olsen 1991, Rimbey et al. 1991). Payment programs have been used in areas where the public places a high monetary value on game species, and license revenues may be used to pay for damages caused by game species (Engle 1963, Rimbey et al. 1991). All 10 state compensation programs mentioned by McDowell and Pillsbury (1959) were for damages caused by game species.

However, not all opinions regarding compensation programs are positive (Olsen 1991). McIvor and Conover (1994) asked northern Utah and southern Idaho farmers and nonfarmers their opinions of hunting and compensation as solutions to damage caused by sandhill cranes (*Grus canadensis*). Both farmers and nonfarmers had a higher approval of hunting than of compensation programs. Most (69%) farmers and 50% of nonfarmers approved of hunting, whereas only 32% of farmers and 23% of nonfarmers approved of compensation programs. In a survey requesting opinions on paying livestock producers for sheep killed by coyotes with general tax monies, only 11% of sheep producers, 7% of cattlemen, and <26% of the general public expressed any form of approval (Kellert 1979). Likewise, in a study by Arthur (1981), ground shooting and fast-acting poisons received a higher rating for predator management than indemnity payments. When asked about compensation for livestock losses to coyote predation, 74% of the general public, 89% of sheep producers, and 93% of cattlemen disapproved of compensation as a management option (Kellert 1979). Additionally, compensation programs rarely pay producers for the full value of all indirect and direct costs associated with wildlife damage. For example, in Utah $50,000 is allocated annually to compensate livestock producers ≤50% of market value for animals killed by black bear (*Ursus americanus*) and mountain lion (*Puma concolor*). If there are more claims than funds, then the amount of compensation is prorated so that all producers receive at least some of the value of livestock killed. Compensation levels have been <25% market value in some years (M. Bodenchuk, U.S. Dep. Agric., Anim. and Plant Health Inspection Serv., Anim. Damage Control, Utah, pers. commun.).

Opposition to compensation programs also comes from wildlife managers. Engle (1963:105) expressed the opinion of some resource managers in saying, "The State's right of trust is to regulate and control the harvests and preservation of game; and the state is not responsible for damages caused by game." He believed that compensation programs were inappropriate for wildlife management and potentially vulnerable to abuse. Many managers believe that wildlife damage should be included in the cost of doing business. Additional difficulties arise when deciding which types of damage to include in compensation programs (Olsen 1991). Why compensate farmers for deer damage to a crop but not compensate the owner of a private business experiencing problems with birds roosting in a nearby tree?

Although compensation programs are an intuitively appealing alternative to more traditional, lethal, management options, they are not suitable for all situations (Musgrave and Stein 1993, U.S. Dep. Agric. 1994). Compensation does not stop the damage problem and may not be appropriate in situations where wildlife causes a risk to human health and safety (U.S. Dep. Agric. 1994). Likewise, producers with a sense of responsibility for the well-being of their livestock may be less likely to accept compensation programs than producers with damage to crops. Failure to address problems attributable to high densities of wildlife and continued population growth may result in harm to the problem species, local vegetation, and other wildlife species as well as increased damage (U.S. Dep. Agric. 1994).

At a time of increasing budget constraints, the financial burden of compensation programs may be unacceptable (Van Eerden 1990, Olsen 1991, Rimbey et al. 1991). In a 1990 survey of programs for crop damage by large mammals, Wisconsin reported payments for compensation and damage prevention materials averaging $920,000 per year and ≤$2,350,000 in some years (Whitt et al. 1993). Idaho paid $500,000 in claims for damage occurring from July to December 1988 (Rimbey et al. 1991). In the Environmental Impact Statement of the Animal Damage

Control (ADC) program, the U.S. Department of Agriculture (USDA) estimated that >$500 million would have been needed annually to replace current damage management techniques with a nationwide compensation program, in contrast to the $38 million program used in fiscal year 1988 (U.S. Dep. Agric. 1994). Additionally, some states may be unwilling to justify compensation for damage by some species and not others (Olsen 1991).

To gain more information on the use of compensation, we surveyed wildlife and agriculture agencies in states (U.S.) and provinces (Canada) for information on programs providing compensation or equipment for wildlife damage prevention. We also examined several hypotheses to determine why some wildlife damage situations are covered by compensation programs and others are not.

Methods

We sent surveys in January 1994 to state and provincial wildlife agencies in the United States and Canada. After 2 additional mailings of the survey, all agencies had responded. We discovered incomplete responses in some states where we were familiar with the available programs. To check response accuracy, the same survey was sent to all state and provincial agriculture agencies in January 1995. Agricultural producers comprise the group most affected by compensation programs and some programs are funded by state agriculture agencies. An additional survey requesting a listing of the species involved in compensation programs and the agency administering the program was sent to each state ADC office. After 2 additional mailings, we received a 100% response from state ADC offices and a 71% response from state agriculture agencies.

The survey sent to the wildlife and agriculture agencies requested information on the species involved in compensation programs, the type of damage covered, and the amount of money spent on compensation. Given the conflict in opinions over the value of compensation programs, we asked if the agency had conducted an attitudinal survey of participants or the general public toward the program, and if the agency had plans to do so in the next 5 years. We also requested information on compensation programs funded by other agencies and on any programs that may have been canceled. Many compensation programs incorporated provisions for providing damage-prevention materials. Respondents were asked to provide information on any programs that provided supplies or financial assistance for wildlife damage management tools.

Results

For every state or province, we compiled responses from all 3 agencies into a master list of compensation programs. When compared to the master list for the state, 8% of the wildlife agencies, 12% of the agriculture agencies, and 9% of the state ADC programs failed to list all available programs in their state or province.

Nineteen states and 7 provinces listed compensation programs. Most programs were funded or administered by local wildlife or agriculture agencies (Table 1). However, a nongovernmental organization, Defenders of Wildlife, had a compensation program for gray wolf (*Canis lupus*) predation on livestock in Idaho, Montana, and Wyoming, and was developing a program for the proposed reintroduction of Mexican wolves (*C. lupus baileyi*) in Arizona and New Mexico (H. Fisher, Defenders of Wildlife, Missoula, Mont., pers commun.). In Montana, the Great Bear Foundation paid producers for livestock killed by grizzly bear (*Ursus arctos*), and the U.S. Fish and Wildlife Service paid producers for livestock killed by reintroduced red wolves (*C. rufus*) in North Carolina. Environment Canada paid 50% of the cost for damage prevention materials and compensation programs for damage caused by waterfowl (Table 1).

Most compensation programs were established for damage caused by ungulates (such as deer [*Odocoileus* spp.], elk [*Cervus elaphus*], moose [*Alces alces*], antelope [*Antilocapra americana*], etc.), but programs compensating for damage by bears were also common (Fig. 1). Upland game birds, wood bison (*Bison bison athabascae*), grizzly bears, bighorn sheep (*Ovis canadensis*), mountain goats (*Oreamnos americanus*), cranes, and beavers (*Castor canadensis*) were mentioned in only 1 or 2 states or

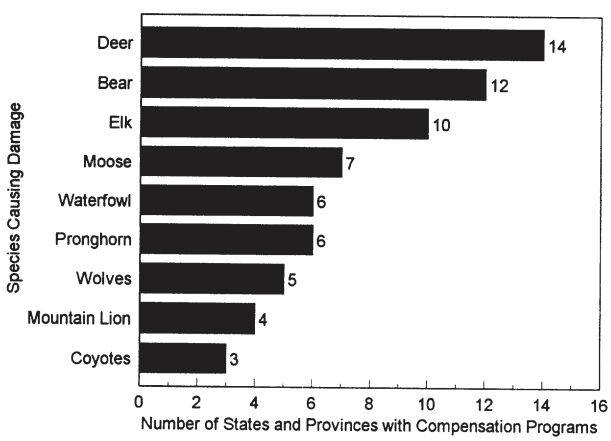

Fig. 1. The most common wildlife damage compensation programs, by species managed.

Table 1. Listing of state and provincial wildlife and agriculture agencies reporting existence of compensation programs(s) for wildlife damage in a 1994 mail survey.

State or Province	Species causing damage	Agency sponsoring program
Alberta	waterfowl	50:50 cost share[a]
	deer, pronghorn antelope, elk, moose	Provinical wildlife agency
Colorado	pronghorn antelope, elk, deer, black bear, mountain lion	State wildlife agency
Idaho	deer, elk, pronghorn antelope, moose, black bear, mountain lion	State wildlife
	gray wolf	Defenders of Wildlife
Kentucky	coyote	State agriculture agency
Manitoba	waterfowl	50:50 cost share[a]
	deer, elk, moose, wood bison, black bear	Provincial wildlife agency
Massachusetts	white-tailed deer, moose	State wildlife agency
Minnesota	gray wolf, elk	State agriculture agency
Montana	gray wolf	Defenders of Wildlife
	grizzly bear	Great Bear Foundation
Nevada	deer, elk, pronghorn antelope	State wildlife agency
New Brunswick	coyote	Provincial agriculture agency
New Hampshire	black bear	State agriculture agency
North Carolina	red wolf	U.S. Fish and Wildl. Serv.
Ohio	coyote	State agriculture agency
Ontario	deer, coyotes, wolves	Provincial wildlife agency
Pennsylvania	coyote	State agriculture agency
	black bear	State wildlife agency
Québec	snow goose (*Chen caerulescens*)[b]	Provincial wildlife agency
Saskatchewan	waterfowl	50:50 cost share[a]
	white-tailed deer, mule deer, elk, pronghorn antelope, moose, bear	Provincial wildlife agency
Utah	deer, elk, moose, pronghorn antelope, ring-necked pheasant, beaver, waterfowl, black bear, mountain lion	State wildlife agency
Vermont	white-tailed deer, black bear	State wildlife agency
Virginia	white-tailed deer, black bear	Counties[c]
Washington	deer, elk	State wildlife agency
West Virginia	black bear	State wildlife agency
Wisconsin	white-tailed deer, goose, black bear	State wildlife agency
Wyoming	big game,[d] trophy game and game birds	State wildlife agency
	gray wolf	Defenders of Wildlife
Yukon	wood bison	Provincial wildlife agency

[a] 50:50 Cost share between provincial wildlife programs and Environment Canada for damage caused by migratory waterfowl

[b] Cash program has subsequently been replaced with hunting permits which may be sold by landowners

[c] Program only available for residents of counties choosing to require a wildlife damage stamp on hunting licenses. Only 4 counties were involved in the 1994–1995 hunting season.

[d] In Wyoming, "big game" includes elk, white-tailed deer and mule deer, moose, antelope, bighorn sheep, and mountain goat; "trophy game" includes mountain lion, black bear, and grizzly bear, and "game birds" includes hunted species like ducks, geese turkeys, cranes, grouse, and pheasant.

provinces. Maine, New Brunswick, New York, and Pennsylvania compensated landowners for livestock lost to domestic dogs.

Compensation programs involving ungulates included damage to cultivated crops (in all 15 states and provinces), standing hay crops and pastures (in 5), stored hay (in 6), and damage to other property including fencing and irrigation equipment (in 8). Programs for lions, coyotes, and wolves (in 11 states and provinces) covered predation on livestock. Bear programs included livestock losses (in 11 states or provinces), damage to beekeeping equipment (in 12), crops (in 9), and other property (in 5). All 6 states or provinces with programs for damage caused by birds covered losses to cultivated crops. Programs in Wyoming and Wisconsin also covered bird damage to property.

The amount of money spent on compensation was variable among states and provinces. Cost estimates provided by respondents sometimes combined the cost of damage prevention materials and program administration. Weather conditions, changes in land use, and fluctuations in local wildlife populations can cause yearly variation in damage claims. Other variables that impacted the amount of money spent on compensation programs included a ceiling on spending (which necessitated pro-rating the claims at the end of the year), the proportion of the property value

reimbursed by the agency, substitution of damage prevention materials and labor for payments, and the issuance of hunting tags for sale by producers instead of cash payments. Reported expenditures in the United States for compensation ranged from US$1,966 to $1,070,000 per state in 1993, compared to Can$10,000 to $1,200,000 for Canadian provinces. Some provinces and states reported restrictions on payments for damage below a certain threshold including Can$250 for ungulate damage and Can$500 for waterfowl damage in Saskatchewan, Can$100 in Manitoba and the Yukon Territories, US$100 in Minnesota, and US$1,000 in Idaho.

Only Saskatchewan, Wyoming, Washington, West Virginia, and Wisconsin reported conducting a review of participant attitudes toward their compensation programs. Wisconsin and Saskatchewan reported conducting a review of taxpayer or general public attitudes toward existing compensation programs. In most instances, the review consisted of public hearings and personal comments to agencies when the program was due for renewal.

Program cancellations were reported by 6 states or provinces. Program cancellations in Massachusetts and Newfoundland were related to budget cutbacks. Claims of program exploitation also contributed to the cancellation of the Newfoundland program. Programs in Quebec and Nova Scotia were intended to last only until landowners could establish alternative management systems. The original "compensation only" program in Wisconsin was canceled in 1980 and replaced with a program that placed an emphasis on providing damage-prevention materials.

Programs loaning or sharing the cost of damage prevention supplies (assistance programs) were more common than compensation programs with 7 provinces and 34 states providing some sort of assistance with nonlethal wildlife damage management tools. Assistance programs were more common in areas with compensation programs (80%) than in areas without compensation programs (58%). In 70% of the states with compensation and assistance programs, at least a portion of the assistance program was related to the damage covered by the compensation program. Programs providing frightening devices (e.g., propane cannons and pyrotechnics) were the most common (in 31 states or provinces) followed by programs that provided or shared the cost of fencing materials (in 25). Other programs (<10 states or provinces each) included loaning or paying all or a portion of the cost of repellents, lure crops, perforated PVC pipe for beaver impoundments, livestock guarding animals, or hiring herders to haze wildlife. The Saskatchewan crop insurance program paid establishment benefits to producers that switched to crops less vulnerable to wildlife damage.

Many programs required producers to meet certain requirements prior to receiving compensation. In 6 states, landowners were required to provide public access to their lands for hunting before qualifying for assistance. Many programs had provisions that could exempt the state or province from paying producers using poor agricultural practices. Producers managing property to benefit from fee hunting for wildlife were excluded from some compensation programs. Producers receiving compensation for wildlife damage in Manitoba or the Yukon received a list of recommendations for preventing additional damage. If they sought compensation a second time in a 5-year period, they were required to provide evidence that they had complied with the agency's recommendations for damage prevention.

Discussion and implications

Nine of the 10 states reporting compensation programs for wildlife damage to crops in the survey by McDowell and Pillsbury (1959) had maintained or expanded these programs. New Hampshire was the only state to reduce its program, dropping coverage

for game species, but adding a program for damage caused by black bear.

All states and provinces with wildlife compensation programs limit coverage to damage caused by a small number of wildlife species. Possible explanations for the inclusion of certain types of damage in compensation programs include compensating only for: (1) major problems where losses are so severe they threaten the profitability of agricultural producers; (2) common problems involving a large proportion of citizens; (3) situations where animal rights or animal welfare concerns restrict the use of management tools; (4) wildlife problems made more severe by management actions taken by governmental agencies; (5) recent problems where the wildlife populations and problems have changed substantially in the last few decades; and (6) problems caused by highly valued species, such as big game species and endangered species.

Compensation programs did not appear to be established in situations where wildlife caused the greatest threat to an agricultural producer's livelihood (Hypothesis 1) because many compensation programs included species that caused minor losses but excluded other species that caused greater problems. For instance, some western states compensated for livestock losses to bears and mountain lions but not to coyotes; Minnesota compensated for elk damage but not deer damage; Utah compensated for ring-necked pheasant (*Phasianus colchicus*) damage to crops but not for damage by blackbirds (*Agelaius* spp.). Conover et al. (1995) estimated that about $22 million in annual timber damage was caused by flooding associated with beaver impoundments in the southeastern United States, but the only compensation program for beaver damage was for damage to crops and irrigation equipment in Utah.

Photo courtesy of Bruce J. Kessler

Compensation programs also did not appear to be targeted at widespread problems involving a large number of citizens (Hypothesis 2). Blackbirds, starlings (*Sturnus vulgaris*), raccoons (*Procyon lotor*), woodchucks (*Marmota monax*), mice and rats (Rodentia), and rabbits (Leporidae) have caused widespread damage in North America (Conover 1994), but these species are not covered by compensation programs. Although 57% of the urban households surveyed by Conover et al. (1995) reported experiencing wildlife damage, there were not any compensation programs for wildlife damage to residences.

The hypothesis that compensation programs are designed primarily as a humane and socially acceptable alternatives to traditional, usually lethal, management tools (Hypothesis 3) is questionable. If the goal is to preserve animals from pain and suffering, or death by humans, then the prevalence of game species in compensation programs is puzzling. If humane issues are the concern, then why preserve a species so that it can be killed during hunting season?

The hypotheses that most compensation programs are designed to compensate for problems that are (1) recent in origin (Hypothesis 4), (2) result from governmental actions (Hypothesis 5), and (3) caused by highly valued species (Hypothesis 6) are all valid explanations. These hypotheses are not mutually exclusive. Most programs were established for species whose populations have increased in recent years because of state or provincial wildlife agency efforts to increase populations of highly valued species (e.g., game species). Consequently, compensation programs can be funded by taxes on user groups (hunting license revenues), general tax revenues, or funds from private organizations designed to help the species in question (e.g., Defenders of Wildlife and Great Bear Foundation).

Many courts have ruled that, although the wildlife resource is owned by the public, governments are not liable for wildlife damage (Musgrave and Stein 1993). Why then do states or provinces voluntarily compensate for damages? Hypotheses 4, 5, and 6 may provide explanations. When problems which limit agricultural productivity are long-standing, the limitation is incorporated into the price of the land. For instance, land with poor, shallow soils sells for less than land with deep, fertile soils. In the same manner, land near a major blackbird roost should sell for less than land further away. However, if the problem started after the current owner purchased the land, then the threat of wildlife damage has not been incorporated into the land price. For these reasons, some wildlife agencies may feel a need to help farmers cope with new problems (Hypothesis 4).

States have the responsibility of managing wildlife for the greater good of society, but in doing so, their actions may create a disadvantage for some people. Only a small portion of the population may suffer the majority of the losses (Conover and Decker 1991, Conover 1994), while others receive most of the benefits. In instances when the state or province's management activities have created or intensified a problem, the agency may feel a sense of responsibility for the losses (Hypothesis 5). Lastly, states may decide to compensate for wildlife damage for purely economic reasons (Hypothesis 6). It may be a good investment of public funds to compensate farmers for damage by valuable animals, such as endangered species or big game species, rather than allowing farmers to kill problem animals. This would be especially true for low-density populations for which it may be cheaper for the agency to compensate landowners than to engage in other management practices such as relocations or habitat improvement.

Problems with compensation programs include (1) they do not address the cause of the problem, and (2) agencies can become trapped in a payment system for an indefinite period of time. To avoid this, many agencies helped landowners acquire resources needed for damage prevention as part of their compensation program. Allowing for the substitution of damage management materials and labor for cash payments ensures that payments will only be granted if the participant has taken all reasonable precautions to prevent damage. The compensation program in Nova Scotia was designed to last only until all landowners had a reasonable opportunity to install damage prevention systems. Other states and provinces required producers to meet agency damage management recommendations before receiving compensation for >1 incident. Compensation programs that included incentives or requirements for participants to institute damage prevention practices were the most likely to survive budgetary constraints. However, damage-abatement requirements assumed that some effective, reasonable damage prevention alternative existed. This is not always the case.

Compensation may not provide an incentive for producers to solve their own problems by improving their management practices. Refusing payments for crops and livestock maintained using unsound agricultural practices is 1 option that some Canadian provinces use to address this issue. A controversial approach is to pay participants only a portion of the actual damage so that there is an incentive for agricultural producers to take action to prevent damage. Although we did not ask this question, 5 states or provinces specifically mentioned that they only compensate for a portion of the actual value. The risk associated with this system is that it may also provide greater incentive for property owners to try otherwise unacceptable management techniques (U.S. Dep. Agric. 1994). Participants using good management techniques may object because they receive partial payment for damages they cannot prevent. Partial payments may be more frustrating to farmers and ranchers than no payments because they may perceive the establishment of payment programs to be an acceptance of responsibility for wildlife damage. Why then should an agency accept only partial responsibility?

Additional difficulties with compensation programs include problems with agency or landowner awareness of all the programs available in their state, the amount of resources used in administering the program, and conflicts over damage assessment. Confusion over the existence of compensation programs could result in frustrated and impatient landowners trapped in red tape or shuffled between agencies. Managers administering compensation programs should take steps to ensure that personnel working in related agencies are aware of their programs and the procedures for receiving assistance.

Another problem is that a large portion of the funds available for a compensation program may be needed to administer the program and provide personnel who can assess the nature and extent of the damage. Contracting with an existing organization such as Federal Crop Insurance whose adjusters are trained to assess crop damage may improve program efficiency. Delegating damage assessment to an agency with a history of addressing these issues may reduce accusations of unfair assessments. Conflicts over the level of damage assessment may still occur, and most states or provinces with compensation programs had provisions for creating review committees to resolve conflicts over damage assessments.

The appeal of compensation programs is evident in the willingness of private organizations like the Great Bear Foundation and Defenders of Wildlife to fund their own programs for species of particular interest to their members. However, compensation programs are not universally well received, and it is important for agencies to establish a system for monitoring the attitudes of participants and the people providing funding for the program.

Many questions regarding the use of compensation programs have not been addressed. Given the studies reporting unfavorable public response to compensation programs (Kellert 1979, McIvor and Conover 1994), wildlife agencies should carefully assess the value of their compensation programs. Questions about any wildlife compensation program that should

be answered include how long the compensation program should last and whether there should be a strategy on how to end it once it has begun. Does compensation really satisfy producers, or is it merely a "better-than-nothing" solution to problems? Producers rarely receive the actual value of the property damaged, but how much payment is needed to satisfy agricultural producers (100%, 50%, no payment but more technical assistance)? Does the compensation program improve good-will for an agency within the community, increase agency moral, or decrease complaints? Given the cost of compensation programs, can these benefits be achieved by other means?

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